

**CITY OF SAINT PAUL
HERITAGE PRESERVATION COMMISSION STAFF REPORT**

FILE NAME: 51 West Seventh Street - Church of the Assumption
DATE OF APPLICATION: February 26, 2013
APPLICANT: Melissa Ekman, Miller Dunwiddie Architecture
OWNER: Church of the Assumption
DATE OF REVIEW: March 28, 2013
HPC SITE/DISTRICT: Individual Historic Site
CATEGORY: Pivotal
CLASSIFICATION: Demolition Permit
STAFF INVESTIGATION AND REPORT: Christine Boulware
DATE: March 20, 2013

A. SITE DESCRIPTION:

Built from 1871-1874, the Church of the Assumption is a Romanesque Revival style structure. The building is 185-feet long and eighty-five-feet wide with a foundation of local limestone. The exterior facade is coursed ashlar limestone accentuated by pilasters of brushed-hammered limestone blocks. Along the length of the southwest and northeast facades the pilasters form eight defined bays. The rear, northwest facade of the building is constructed as a half-round structure (apse) and is approximately one story shorter than the rectangular building. Located adjacent to the northeast corner of the building, where the rounded and rectangular portions meet, there is an octagonal chimney that is seventy-five feet tall- approximately the height of the ridge of the main roof. The base of the chimney is attached to the apse. The slate roof of the rectangular portion of the building is gabled with mounted iron crosses at the ridge. At the front, southeast facade there are two identical towers each 210-feet tall. Over the main entry is a statue of St. Mary's Assumption. Architect Joseph Reidel based the design of the church on the Ludwigskirche in Munich by Friedrich con Gaertner.

B. CHANGES PROPOSED:

DEMOLITION

The applicant proposes to demolish the octagonal chimney on the northeast corner of the main church. Demolition will consist of removal of the masonry chimney to thirty-six inches below existing grade and removal of any masonry connections between the chimney and the church. The chimney foundation below thirty-six inches will remain. If the bottom slab is determined to be solid the contractor will crush or break it up prior to backfilling.

REPAIR

The applicant proposes to repair and clean the masonry on the church exterior as required after the removal of the chimney and associated connections/penetrations. Any penetrations will be in-filled with masonry or concrete as required prior to backfilling. The foundation is to be backfilled with compact fill and topped with six inches of topsoil. Grade is to slope away from the church a minimum of five degrees. At ten feet, zero inches from the church, grade is to transition in to existing grade. Church is to determine the finish plantings.

C. BACKGROUND:

The 1903 Sanborn Insurance map (last updated in 1925) shows the octagonal chimney at the northeast corner of the church attached to a one-story structure designated for coal. The map denotes a connection from the coal structure to the church building, but no connections from the

chimney to the building directly. The map also shows an additional school building directly behind the northwest facade of the building. The map denotes that this school building was heated with stoves, and was not connected to the chimney. Both the school and the coal structure are no longer standing. The area where these structures stood is currently being used as a parking lot.

D. GUIDELINE CITATIONS:

The Preservation Program for the Church of Assumption heritage site is as follows:

Ordinance No. 16640- 3/6/1980

*Because the architectural design of Assumption Church is of recognized national significance, the **exterior appearance should be preserved in a manner consistent with the original design intent**. Since the Church is one of downtown's few primary historic "landmarks" (in visual geographic dominance), any development on the immediate site should maintain and support the general view of the church. The immediate site (including Assumption School, the Rectory, parking space, and green area, bounded by West Seventh Street, Saint Joseph's and Exchange Street) is appropriately open on the southwest, revealing a fine view of the church's west side elevation and front tower entrance. Since the lowest part of the east side elevation is already obscured by adjacent buildings, the open space (and view) on the west side should be maintained. Any further development of the present parking area (in the southwest corner of the site) into nearby green area should be discouraged. The black iron fence which presently surrounds the entire site including the school, a rare example of now disappearing street furniture, enhances the historic feeling of the church, school and site. It should be preserved. Rectory is not subject to permit review.*

The exterior appearance of Assumption School should be preserved in a manner consistent with the original design intent. The visual relationship with the rest of the Assumption Church site should be maintained. Green space to the northwest (corner of Saint Joseph's and Exchange Street) should remain open. The Commission invites consultation with its Advisory Design Committee on any exterior signage or site landscaping.

SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION:

- 1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.*
- 2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.*
- 3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.*
- 4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.*
- 5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*

6. *Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.*

7. *Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.*

8. *Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.*

9. *New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.*

10. *New additions and adjacent or related new construction will be undertaken in a such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.*

E. FINDINGS:

1. The Church of the Assumption is designated as a Heritage Preservation Site (Ordinance No. 16640)

DEMOLITION

2. Although not included in the original construction, the octagonal chimney was constructed during the period of significance for the site, as evidenced in a photo dated 1895.

3. Although it is a historic feature, staff does not identify the chimney to be a character defining feature of the main church building or the surrounding site, and the loss of which will not have a negative impact on the significance of the site.

4. The demolition of the rear chimney have a visual impact on the site, but will not negatively impact the historic significance.

5. The current condition of the site provides no other context for the chimney in relation to other buildings on the site.

REPAIR

6. The physical connection of the chimney to the church is at the base and below grade.

7. The removal of the connection will not have a negative impact on the significance of the building or the site.

8. The repairs to the area of connection comply with the Program for Preservation and the

Secretary of the Interior's Standards for Rehabilitation as it will preserve the exterior appearance of the church in a manner compliant with the original design intent, and will result in no loss of historic fabric.

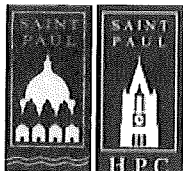
F. STAFF RECOMMENDATIONS:

Based on the findings, staff recommends approval of the application to remove the chimney and repair the area where it was connected to the church, provided the following condition is met:

1. Applicant shall submit a final scope of work and material specifications for masonry repairs to HPC staff for final review and approval.

G. ATTACHMENTS

1. HPC Application
2. Structural Report and photos
3. Historic Map



Saint Paul Heritage Preservation Commission
Department of Planning and Economic Development
25 Fourth Street West, Suite 1400
Saint Paul, MN 55102
Phone: (651) 266-9078

HERITAGE PRESERVATION COMMISSION DESIGN REVIEW APPLICATION

This application must be completed in addition to the appropriate city permit application if the affected property is an individually designated landmark or located within an historic district. For applications that must be reviewed by the Heritage Preservation Commission refer to the HPC Meeting schedule for meeting dates and deadlines.

1. CATEGORY

Please check the category that best describes the proposed work

- | | | |
|--|---|--|
| <input type="checkbox"/> Repair/Rehabilitation | <input type="checkbox"/> Sign/Awning | <input type="checkbox"/> New Construction/Addition/ |
| <input type="checkbox"/> Moving | <input type="checkbox"/> Fence/Retaining Wall | Alteration |
| <input checked="" type="checkbox"/> Demolition | <input type="checkbox"/> Other _____ | <input type="checkbox"/> Pre-Application Review Only |

2. PROJECT ADDRESS

Street and number: 51 West Seventh Street Zip Code: 55102

3. APPLICANT INFORMATION

Name of contact person: Melissa Ekman

Company: Miller Dunwiddie Architecture

Street and number: 123 North 3rd Street, Suite 104

City: Minneapolis State: MN Zip Code: 55401

Phone number: (612) 278-7767 e-mail: mekman@millerdunwiddie.com

4. PROPERTY OWNER(S) INFORMATION (If different from applicant)

Name: Church of the Assumption - Julie Malecha

Street and number: 51 West Seventh Street

City: St. Paul State: MN Zip Code: 55102

Phone number: (651) 224-7536 e-mail: jmalecha@assumptionsp.org

5. PROJECT ARCHITECT (If applicable)

Contact person: Melissa Ekman – see Applicant information above

Company: _____

Street and number: _____

City: _____ State: _____ Zip Code: _____

Phone number: (____) _____ e-mail: _____

6. PROJECT DESCRIPTION

Completely describe ALL exterior changes being proposed for the property. Include changes to architectural details such as windows, doors, siding, railings, steps, trim, roof, foundation or porches. Attach specifications for doors, windows, lighting and other features, if applicable, including color and material samples.

DEMOLITION:

Remove masonry chimney to 36" below existing grade and remove any masonry connections between the chimney and church. Chimney foundation below 36" is to remain. Contractor is to verify the bottom slab condition. If the slab is solid, contractor is to crush or break it up prior to backfilling.

NEW CONSTRUCTION:

Repair and clean masonry on the church exterior as required after the removal of the chimney and associated connections/penetrations. Infill any penetrations with masonry or concrete as required prior to backfilling. Foundation is to backfilled with compact fill and top with 6" of topsoil. Grade is to slope away from the church a minimum of 5 degrees. At 10'-0" from the church, grade is to transition into existing grade. Church is to determine the finish plantings.

Attach additional sheets if necessary

7. ATTACHMENTS

Refer to the Design Review Process sheet for required information or attachments.

****INCOMPLETE APPLICATIONS WILL BE RETURNED****

ARE THE NECESSARY ATTACHMENTS AND INFORMATION INCLUDED?

x YES

Will any federal money be used in this project?	YES	_____	NO	<u>X</u>
Are you applying for the Investment Tax Credits?	YES	_____	NO	<u>X</u>

I, the undersigned, understand that the Design Review Application is limited to the aforementioned work to the affected property. I further understand that any additional exterior work to be done under my ownership must be submitted by application to the St. Paul Heritage Preservation Commission. Any unauthorized work will be required to be removed.

Signature of applicant: ME

Date: 2/28/2013

Signature of owner: Janie Malachuk

Date: 2/28/13

FOR HPC OFFICE USE ONLY

Date received: 2-28-13

FILE NO. 13-015

District: _____ / Individual Site: ASSUMPTION CHURCH

Contributing/Non-contributing/Pivotal/Supportive/:

Type of work: Minor/Moderate/Major

____ Requires staff review

Supporting data: YES NO
Complete application: YES NO

The following condition(s) must be met in order for application to conform to preservation program:

It has been determined that the work to be performed pursuant to the application does not adversely affect the program for preservation and architectural control of the heritage preservation district or site (Ch.73.06).

HPC staff approval _____

Date _____

☒ Requires Commission review

Submitted:

- ☐ 3 Sets of Plans
- ☒ 15 Sets of Plans reduced to 8 1/2" by 11" or 11" by 17"
- ☐ Photographs
- ☐ City Permit Application
- ☒ Complete HPC Design Review application

Hearing Date set for: 3-28-13

City Permit # _____ - _____

EXTERIOR ASSESSMENT AND DEMOLITION RECOMMENDATIONS
FOR THE
CHIMNEY AT THE CHURCH OF THE ASSUMPTION



ASSUMPTION PARISH

• 51 WEST SEVENTH STREET •

PREPARED FOR THE:
ST. PAUL, MN 55102

February 26, 2013

miller dunwiddie
ARCHITECTURE

123 North Third Street Suite 104 Minneapolis MN 55401-1657 www.millerdunwiddie.com p 612-337-0000 f 612-337-0031

EXTERIOR ASSESSMENT AND
DEMOLITION RECOMMENDATIONS
FOR THE
CHIMNEY
AT THE
CHURCH OF THE ASSUMPTION

ASSUMPTION PARISH
51 WEST SEVENTH STREET
ST. PAUL, MN 55102

PREPARED BY:
MILLER DUNWIDDIE ARCHITECTURE, INC.

ARCHITECT OF RECORD
123 North Third Street, Suite 104
Minneapolis, MN 55401

MEYER, BORGMAN, AND JOHNSON
CONSULTING STRUCTURAL ENGINEERS
12 South Sixth Street, Suite 810
Minneapolis, MN 55402

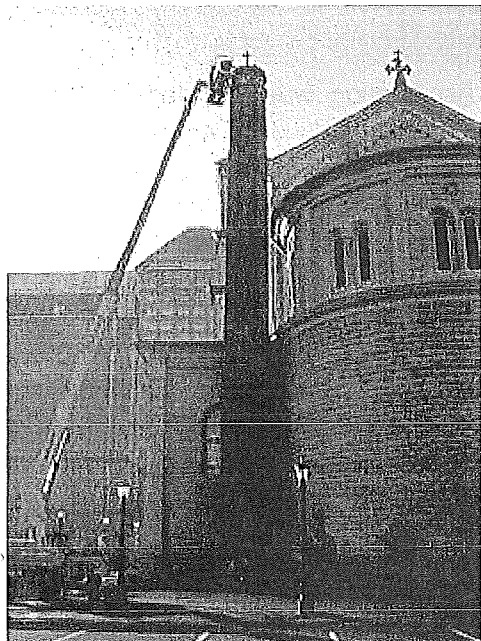
McGOUGH CONSTRUCTION
CONSULTING CONSTRUCTION CONTRACTORS
2737 Fairview Avenue North
St. Paul, MN 55113

February 26, 2013

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INTRODUCTION



In August of 2011, the Church of the Assumption retained a consultant team led by Miller Dunwiddie Architecture, Inc. (MDA) that included Meyer Borgman Johnson (MBJ) and McGough Construction to evaluate the existing conditions of the church chimney and the stone failure at the Rectory stairs, and to make recommendations for their repairs. MDA prepared an "Exterior Assessment and Repair Recommendations for the Church of the Assumption Chimney and Rectory Stairs" and presented it to Assumption in December of 2011.

The report included the existing conditions found during visual inspection by the team, recommended treatments, and opinions of probable costs for the noted repairs and corrections.

Specifically, the team was directed to:

- Review any existing information regarding the buildings (original drawings, drawings and specifications of past renovation projects, past assessment reports, pre-design reports, etc.).
- Perform further research at historic repositories (Northwest Architectural Archives, MHS, etc.) to try to find further information regarding the buildings that may be of assistance to the effort.
- Inspect, document the deterioration, and provide recommendations for the church chimney and the exterior stairs on the south side of the Rectory.

In the spring of 2012, MDA and the church met with staff from the St. Paul Heritage Preservation Commission (HPC) to review the 2011 report. In the summer of 2012, the church proceeded with the recommended repairs to the Rectory stairs, which were completed in the fall of 2012.

Since the 2011 report was completed, Assumption has replaced the church building's boiler with a new boiler, and the chimney is no longer needed. After many discussions and much deliberation, the church has now determined that they would like to remove the no longer needed chimney. This report includes a general history of the church and second school (removed), which the chimney was originally built to serve, the chimney condition and observations, and recommendations and related costs.

BUILDING DESCRIPTION AND GENERAL HISTORY

CHURCH

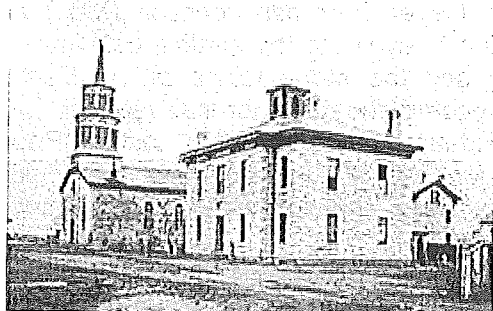


Image dated 1865, shows the first church (1856) and second school (1864), courtesy of the Minnesota Historical Society.

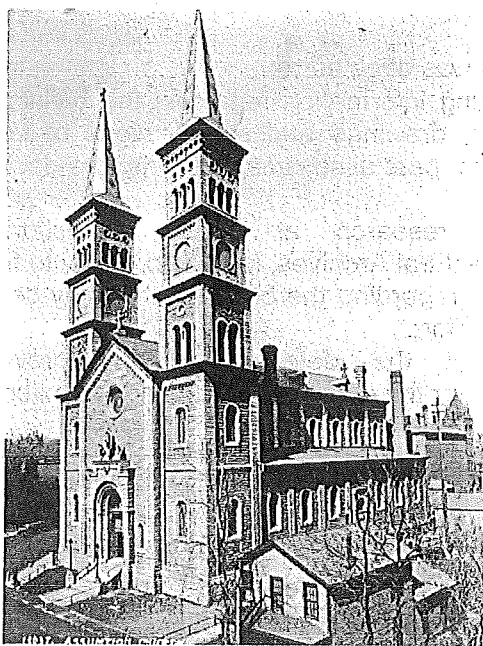


Image dated 1896, courtesy of the Minnesota Historical Society.

The Church of the Assumption was founded in 1856 by Bishop Joseph Cretin and served newly arrived immigrants from Germany. Ground was broken for the first church on Aug. 15, 1856, the Feast of the Assumption. The original structure was wood with a single bell tower and sat just north of the present site.

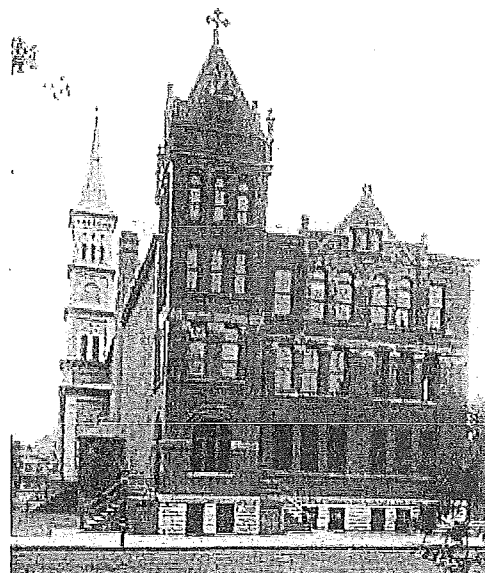
By 1871, the parish had outgrown the building, and work began on the new church. Its Romanesque architecture - the towering twin spires, massive stone presence, rounded arches and apse over the altar - were modeled after the Ludwigkirche in Munich.

Assumption's east tower holds four bells heard in every corner of downtown St. Paul. The Angelus Bell was installed in the first church. Four bells, including the original from the first church were installed when the present church was constructed. Before 1975, when the bells became electrically controlled, they were rung by pulling 200-foot-long ropes.

Much of the church's interior design and decor remains unchanged from the construction in the late 1800s. The statue of Mary in the center of the high altar dates from the first church.¹

¹ Historical information obtained from www.assumptionsp.org.

SCHOOL



1887 school, image provided by the church staff.

The first school built on the site was a wooden structure built in 1860. In 1863, the school was destroyed by a fire. In 1864 the school was rebuilt in stone and still stands today.

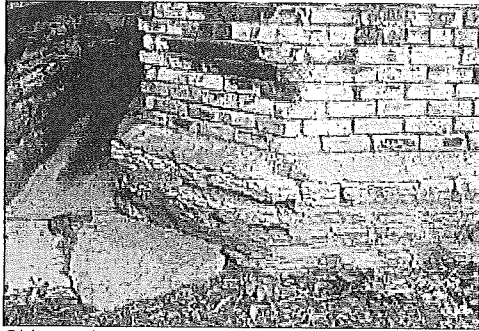
By 1887, another school was built to accommodate the growing student population. The school was built partially on the original church site, to the north of the current church location. With this school a chimney was built to service both the school and church boiler rooms.

In 1951, the 1887 school was demolished, and another was built in 1952. The chimney stack serving both the church and the 1887 school remained in use. By 1972 the 1952 school was closed, and it was demolished in 1992.

The remaining 1887 chimney is located at the northeast corner of the church. The chimney continued to serve as the stack for the boiler located in the church's lower level. The interior masonry of the chimney was deteriorated so badly that it was causing the boiler to consistently miss-fire. Church maintenance staff had to regularly crawl into the boiler breeching, a difficult and dangerous job, and remove the masonry debris so that the boiler would operate. The boiler was replaced with multiple, high-efficiency, side-venting boilers in the summer of 2012. Because of that, the chimney is no longer needed.

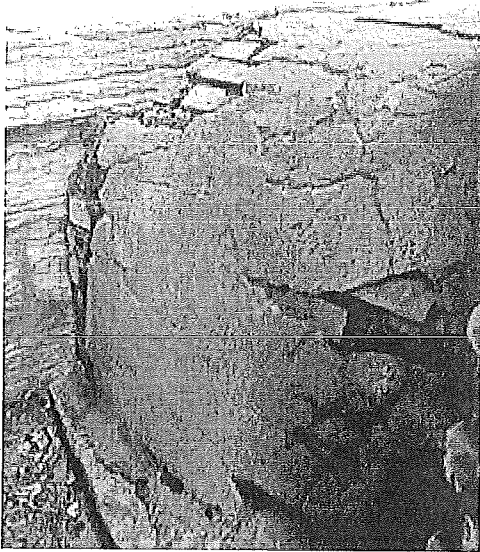
CHIMNEY CONDITION OBSERVATIONS AND RECOMMENDATIONS

2011 ARCHITECTURAL EVALUATION SUMMARY:



Chimney base.

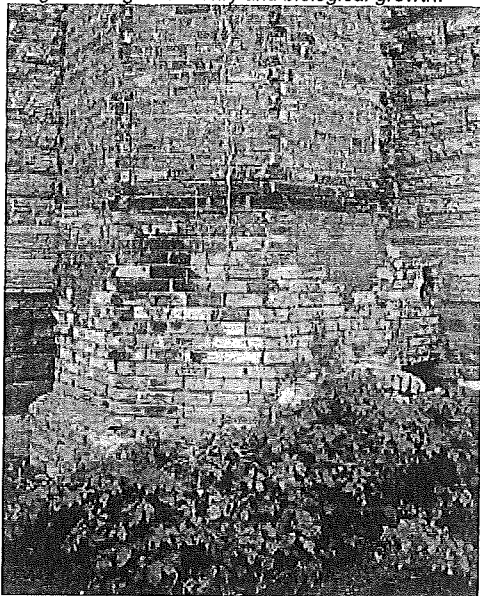
The shaft of the chimney appears to be Chaska brick, a very soft and porous brick, sitting on a Platteville limestone foundation. The foundation stone and joints are severely deteriorated and have been parged-over with multiple layers of mortar. There is also significant biological growth at the masonry of the chimney and the church. Due to this area being located on the north side of the church, and the chimney mass blocking airflow, the biological growth is most likely the result of very poor air circulation in this area.



Parge coating at masonry and biological growth.

The first 15 courses of brick above the foundation have severely deteriorated mortar joints and spalled brick surfaces. The remaining bricks up to the chimney cap are severely discolored by atmospheric pollutants. The top five to six feet of the chimney also have severely deteriorated joints and spalled brick faces.

A visual inspection of the chimney from grade also shows that the chimney is leaning towards the northeast corner of the church. McGough Construction Company was engaged to verify the chimney dimensions and the extent that the chimney is leaning (see Appendix A for diagram). Through the use of a lift, the team was also able to visualize the interior of the chimney with a camera.

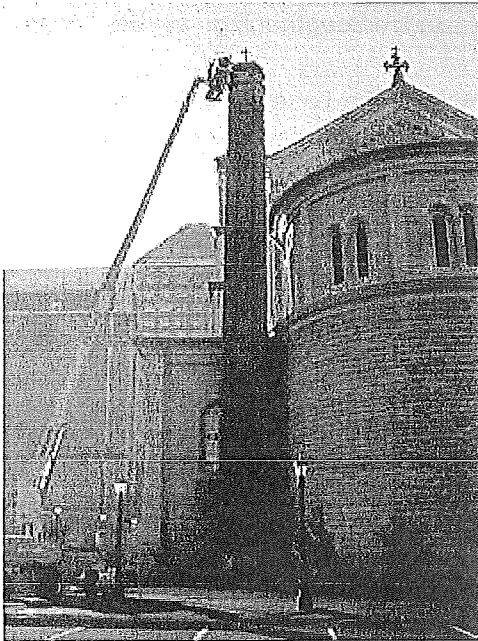


Efflorescence, spalling brick, and mortar joint deterioration at the bottom 15 courses above the stone foundation.

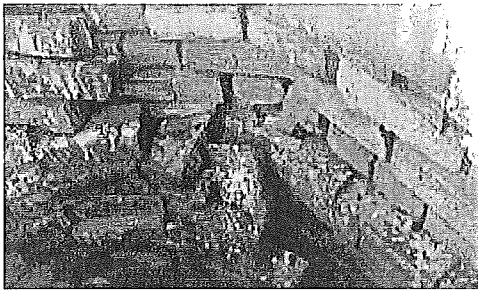
The interior top eight feet of masonry was seen to be in extremely poor condition with the majority of the inner wythe of brick missing and with very sandy mortar joints. The next approximately 15 feet were also in very poor condition; however, with less brick damage. The church staff has reported that removal of buckets-full of masonry rubble and debris is regularly required from within the shaft for the boiler to function.

See Appendix B for the detailed investigation report prepared by Meyer Borgman Johnson.

CHIMNEY CONDITION OBSERVATIONS AND RECOMMENDATIONS



Looking south – the chimney leans south and west towards the church.



Inside chimney brick condition at the top of the stack.

Recommendation Options:

Option A – Chimney removal.

If the church elects to connect to the city of St. Paul's district heat or replace the boiler with a higher efficiency type, the chimney will no longer be required. Due to the level of deterioration of its masonry and the fact that the chimney is not original to the church structure, removal would be an option. This option would require a full HPC submittal, review, and approval.

Option B – Chimney partial removal (the top 20 feet).

The portion of the chimney above the apse roof is in the poorest condition; and if repair work is not performed, it will continue to deteriorate and potentially create life safety issues. Removing the top 20 feet would significantly reduce wind loads; however; it could also create venting and draw issues for the boiler system whether it remains active or not. This option would require full a HPC submittal, review, and approval.

Option C – Chimney repair and strengthening.

There are multiple steps that would be required to stabilize the chimney which would not be an issue if St. Paul district heat is used. The following sub-options could be reviewed by HPC Staff via a Certificate of No Change (CNC). (See Appendix A – Meyer Borgman Johnson Structural Evaluation for additional information.)

1. Chimney movement monitoring: If the chimney is to remain, it should be monitored to determine if it is actively moving or will remain in its current position. Knowing this could eliminate the need for the work outlined in Option C.3.a & b.
2. Chimney repair and strengthening of the upper portion: The portion of the chimney above the apse roof is in the poorest condition. The deteriorated masonry material should be repaired and replaced if missing. Given the out-of-plumb condition, the installation of steel reinforcement should be done. The exterior should be repointed and cracks repaired.

CHIMNEY CONDITION OBSERVATIONS AND RECOMMENDATIONS

3. Chimney repair and strengthening at the base or bracing:

- a. Strengthening: The base could be strengthened to meet current code-level forces due to wind loading. One method could be the use of steel straps. Alternatively, the interior could be lined with reinforced concrete the entire height of the chimney.

Lining the interior of the chimney will require additional structural evaluation and design time to ensure sufficient stabilization.

- b. Bracing: Alternatively, it may be possible to brace the chimney at the church roof level. Additional investigation of the church framing will be required. Repair and strengthening of the upper portion of the chimney would still be required, but would eliminate work required at the base.

Bracing the chimney against the existing church will require additional structural evaluation and design time to ensure sufficient stabilization of the chimney. At this time, it is unknown if the existing church structure could withstand the additional loading the chimney would produce. If bracing is possible, it is probable that the bracing would require through-wall bolting at the church exterior walls. This could result in an undesired visual impact at the interior of the historic church.

4. If the chimney remains but is inactive, its top should be capped with a metal or concrete cap.

CHIMNEY CONDITION OBSERVATIONS AND RECOMMENDATIONS

2011 REPORT SUMMARY

In surveying the existing conditions at The Church of the Assumption in 2011, MDA recommended that the following work be considered in order to stabilize the chimney and prevent further deterioration:

A final decision will need to be made by Assumption whether to replace the boiler or switch to Saint Paul District Heating or not. If the boiler is to remain active, Option B will likely result in a chimney that is too short to function properly, resulting in the need for a metal stack to be inserted in it and up to the original chimney height. If the boiler becomes inactive, removing only a portion of the chimney will result in an odd looking remnant of the chimney, out of scale with the church, and is not recommended. This option is not an acceptable solution either functionally or historically.

If work to remove or repair the chimney is not immediately feasible because of funding or other reasons, it should be monitored (Option C.1) to determine if it is actively moving and/or in danger of falling against the church. This is a low cost option to buy time and gather additional information. However, it does not address the ongoing accumulation of debris at the bottom of the stack that affects the boiler operation.

If the chimney becomes inactive, Option A would be the most desirable long-term solution for Assumption. It has the lowest cost and, with its removal, there would no longer be any associated ongoing maintenance costs.

Option C has a higher cost and ongoing maintenance costs, although they will initially be minimal once it has been repaired.

NEXT STEPS

Since the initial report was prepared a year ago, the church has replaced its antiquated boiler with a smaller more energy efficient model rendering the chimney unnecessary. The church has decided to pursue Option A – Chimney Removal.

The chimney is severely deteriorated at the top 20 feet and was measured to be leaning approximately one foot towards the church, which presents life safety issues for users of the church and/or passerby at the exterior. While MDA did not feel that there was an immediate threat of collapse, they determined that the chimney masonry is overstressed at the

CHIMNEY CONDITION OBSERVATIONS AND RECOMMENDATIONS

base during code-level wind loading. In order to stabilize, repair, and retrofit the chimney to meet current code levels, the cost is much higher than to remove the chimney in full. Furthermore, the church would incur the costs of annually maintaining the chimney.

Additionally, the chimney creates a partially hidden, unwelcoming, and dangerous area where the church has reported weekly incidents of defecation, drug use, and sexual activity.

It is recommended that the chimney, and associated masonry connections to the church, be removed up to 36 inches below existing grade, leaving the remaining foundation in place. The slab condition of the chimney is to be verified, and if there is an existing slab, it is to be broken up or crushed before being backfilled with compacted soil to match the existing grade elevation. Any wall penetrations into the church are also to be infilled prior to backfilling. The landscaping is to be determined by the church. Where there currently are masonry connections between the chimney and the church above grade, the exterior masonry church walls are to be cleaned and repaired after the removal of the connections.

(See Appendix C for detailed drawings for the chimney removal.)

Over the years, the church has done extensive work to stabilize and preserve the exterior of the church, rebuild the exterior stairs on the east and west elevations of the church, and repair the south steps of the rectory. In lieu of spending the excessive funds to stabilize an obsolete chimney, the church would rather use those funds to continue preservation efforts at the remaining old school on the grounds.

CONSTRUCTION ESTIMATE

CONSTRUCTION ESTIMATE

See Appendix D for McGough Construction Company's estimate breakdowns presented in 2013 dollars.

Chimney Work:

Option A – Full Chimney Removal

\$76,842

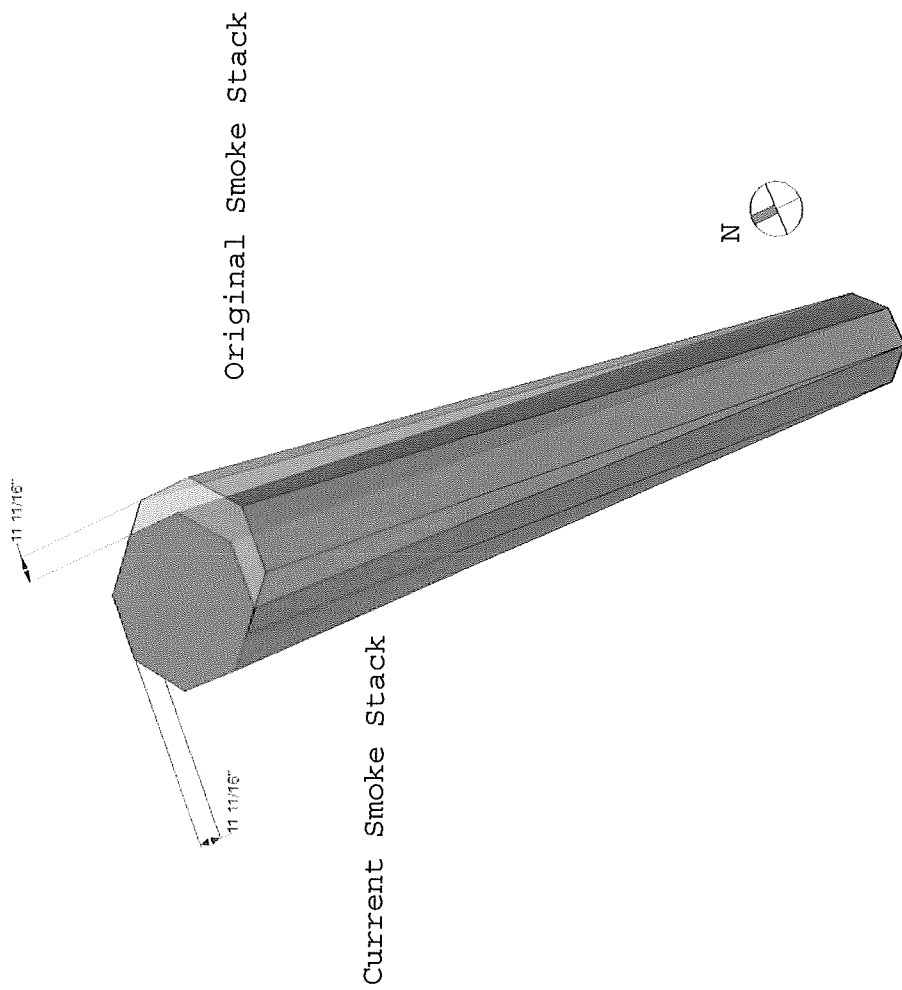
Option B – Removal of the top 20 feet

This was not priced since it was deemed an unacceptable solution both historically and functionally.

Option C – Repairs: removal and rebuilding the top 15 feet along with structural stabilization.

\$214,112

Note: Structural stabilization of the chimney has not been confirmed and will require additional evaluation and design.



MEYER | BORGMAN | JOHNSON

STRUCTURAL DESIGN + ENGINEERING

October 13, 2011

Charles D. Liddy Jr., FAIA, NCARB
Miller Dunwiddie Architecture
123 North Third Street Suite 104
Minneapolis, MN 55401
CLiddy@millerdunwiddie.com

RE: Assumption Catholic Church Chimney Investigation
MBJ Project No.: 11.588.0

Dear Chuck,

Thank you very much for contacting us regarding the chimney and rectory stairs study at Assumption Catholic Church in St. Paul. Meyer, Borgman and Johnson (MBJ) has provided structural engineering services for other areas of the church, and we appreciate the opportunity to continue to work with you. The purpose of this letter is to summarize the chimney investigation and analysis results; the rectory steps are not included in this letter.

Our first project meeting and site visit took place on August 31, 2011 and included a walk-around of the rectory stairs and chimney, as well as a meeting with the client. The interior chimney survey was performed on September 29, 2011 by McGough. A lift was used to access the top of the chimney; a camera was lowered into the chimney. Photographs were moderately successful given the high winds. The exterior of the chimney was observed from the ground by MBJ, using binoculars and digital photos.

In summary, the chimney could be repaired and retrofitted to meet current code level loads, or removed in part or completely. In its current position and condition, the chimney does not have enough capacity to meet current code-level wind loads. Furthermore, the interior of the chimney, especially at the portion above the roof, is in very poor condition. If the chimney is not considered to contribute to the historic church complex, removal or partial removal of the chimney would eliminate the areas of masonry in poorest condition while reducing the overall wind loads. Alternatively, retrofit options are provided.

Our observations, conclusions, and recommendations are outlined in detail below.

OBSERVATIONS

- 1) The chimney is 75 feet tall measured from the concrete cap to the base of interior chimney opening where the structure returns into the boiler room. The exterior diameter at the top of the chimney was measured to be approximately 5 feet 8 inches in diameter with an interior diameter

of 2 feet 8 inches to 3 feet (the interior diameter varies at the top due to the corbel and concrete cap). The exterior diameter at the base is approximately 7 feet, with an interior diameter of 3 ft (as measured from the interior).

- 2) The interior brick masonry at the top 8 feet of the chimney was reported to be in extremely poor condition with many missing bricks. Likewise, the interior mortar joints at the top 15 feet were reported to be in poor condition. The exterior masonry appeared to be in fair condition at the base with gradually increasing deterioration towards the top of the chimney; the masonry at the top of the chimney is in poor condition. Some cracks are visible, but a pattern was not evident.
- 3) The tower is out of plumb, leaning towards the church, by approximately 12 inches at the top as measured by McGough

NUMERICAL ANALYSIS

A summary of our numerical analysis follows:

Chimney Geometry	
Height	75 feet
Outer diameter at top	5 feet 8 inches
Inner diameter at top	3 feet
Outer diameter at base	7 feet
Inner diameter at base	3 feet
Maximum Out-of-plumb dimension	12 inches

Chimney Loads	
Weight	115 pounds per cubic foot (pcf), solid wall construction assumed
Wind Loading Parameters	
Basic Wind Speed (V)	90 miles per hour (mph)
Exposure Category	C
Importance Factor (I)	1.0
Design wind pressure at mid-height	19 pounds per square foot (psf)

Based on the parameters above, the chimney masonry is overstressed at the base during code-level wind loading. It may be possible to reduce the code level loads by reducing the Exposure Category to B based on further study of the local topography. At either exposure, the demand at the base of the tower due to wind loads varies from approximately 30 - 60 pounds per square inch (psi) of tension to 80 - 150 psi of compression. While the compression stresses are acceptable at the base for this type of masonry construction, it is generally desirable to have tension forces below approximately 10 psi, or no tension at all. Without wind, the base of the chimney (including the out-of-plumb geometry), has sufficient

structural capacity. However, given the extremely poor condition of the top portion of the chimney (approximately 15 feet), there is very little capacity to resist wind or even gravity loads.

RECOMMENDATIONS

The chimney could be repaired and retrofitted to meet current code level loads, or removed in part or completely. Recommendations are listed below.

- A. Partial to Full Removal. If the chimney is considered to be functionally obsolete and non-historic, it can be removed or partially removed. A partial removal should include approximately the top 20 feet. By lowering the height of the chimney, the wind loads are sufficiently reduced, and the poorest areas of masonry are removed. Alternatively, the chimney could be removed in its entirety.
- B. Monitor Chimney Movement. Based on our limited investigation, it is unclear whether the chimney is actively moving, or whether the chimney will remain in its current configuration. The chimney plumbness should be measured and recorded annually to determine whether an underlying problem at the foundation should be corrected.
- C. Repair and Strengthen the Upper Portion of Chimney. For the purposes of this investigation, the "upper" portion of the chimney is considered to be the extent above the apse roof (the second "round" cornice line). The masonry at the chimney should be repaired at the interior; brick material should be re-installed or replaced with a compatible alternate, such as concrete. Given the out-of-plumb condition at the top, some steel reinforcement should be installed – either as reinforcement in a concrete repair solution, or added steel reinforcement at the replaced masonry. The exterior should be re-pointed and cracks repaired. The out-of-plumb appearance will remain. Per recommendation A, the repaired chimney should be monitored for movement.
- D. Repair and Strengthen the Base of the Chimney

Option 1: Strengthening. The base of the chimney should be strengthened to meet the code-level forces due to wind loading. Additional tension capacity is needed to resist wind loads. One method for strengthening is to add steel straps at the existing masonry, and anchor them to the foundation. Steel straps could be concealed at the interior or buried within the existing masonry. Alternatively, the chimney could be lined with reinforced concrete. The reinforced concrete liner could be extended for the entire length if the same solution is selected for the upper portion of the chimney.

Option 2: Bracing. It may be possible to support the chimney at the roof level. Further investigation of the church framing would be required. Any bracing of the chimney would be visible, and would extend from the chimney to the roof. The connection to the roof framing would most likely be done through the roof assembly, and would require architectural input for flashing and roofing repair. For this option, repair and

October 13, 2011

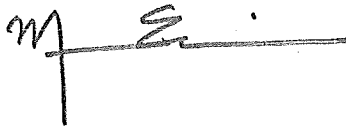
Page 4 of 4

strengthening would be required at the top of the chimney, but could be eliminated at the base.

Please call if you would like to discuss any of the recommendations in more detail.

Sincerely,

MEYER BORGMAN JOHNSON

A handwritten signature in dark ink, appearing to read 'ME' followed by a horizontal line and a vertical stroke.

Meghan Elliott, PE, Assoc. AIA
Associate
(612) 614-3651

Appendix C:
Chimney Demolition Drawings (February 15, 2013)

CHURCH OF THE ASSUMPTION

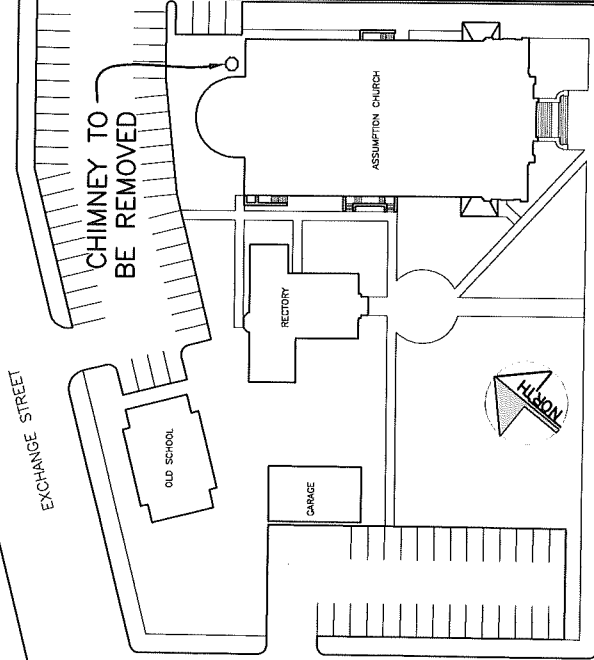
CHIMNEY DEMOLITION

51 SEVENTH STREET WEST, ST. PAUL, MINNESOTA 55102

MDA PROJECT NUMBER : ASM1202

PROJECT LOCATION

NOT TO SCALE



SHEET INDEX

GENERAL

T1 TITLE SHEET, SHEET INDEX,
GENERAL NOTES, LOCATION MAP,
PROJECT INTENT, SPECIFICATIONS,
AND PROJECT TEAM

ARCHITECTURAL

A1 CHIMNEY DEMOLITION PLAN,
SECTION, AND DETAIL

PROJECT TEAM

OWNER

ASSUMPTION CATHOLIC CHURCH
51 SEVENTH STREET WEST
ST. PAUL, MN 55102
CONTACTS: JULIE MALECHA
MARK DORNFIELD
PH: (651) 224-7536
FAX: (651) 224-8514
jmalecha@assumption.org
mdornfield@assumption.org

ARCHITECT

MILLER DUNWIDDIE ARCHITECTURE
123 NORTH THIRD STREET
SUITE 104
MINNEAPOLIS, MN 55401
CONTACT: MELISSA EKMAN
PH: (612) 337-0000
FAX: (612) 337-0031
mekman@millerdunwiddie.com

GENERAL

CONTRACTOR

MCGOUGH CONSTRUCTION
2737 FAIRVIEW AVENUE NORTH
ST. PAUL, MN 55113
CONTACT: JONATHAN ISERMAN
PH: (651) 633-5050
FAX: (651) 633-5673
jiserman@mcgough.com

APPLICABLE CODES

BUILDING CODE

2006 EDITION AS ADOPTED AND
AMENDED BY THE STATE OF
MINNESOTA, 2007

STATE OF MINNESOTA BUILDING CODE: 2007 EDITION

ACCESSIBILITY CODE

MINNESOTA RULES CHAPTER 1341: 2006 EDITION

miller dunwiddie
ARCHITECTURE

123 North Third Street Suite 104
Minneapolis MN 55401-1657
www.millerdunwiddie.com
P 612-337-0000 F 612-337-0031

PROJECT:
**Church of the Assumption
Chimney
Demolition**
St. Paul, Minnesota

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS
PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY
LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

Signature
Melissa M. Ekman, AIA, NCARB
Name
February, 15, 2013 47993
Date License #

REVISIONS:
Mark

Date Description

COMM. NO.: ASM1202

DATE: February 15, 2013

DRAWN: MME

CHECKED: CDL

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PROJECT INTENT

DEMOLITION

Remove masonry chimney to 36" below existing grade and remove any masonry connections between the chimney and church. Chimney foundation below 36" is to remain. Verify bottom slab condition, if slab is solid, crush or break-up prior to backfilling.

NEW CONSTRUCTION

Repair masonry on the church exterior as required after the removal of chimney and associated connections/penetrations. Infill any penetrations with masonry or concrete as required prior to backfilling. Backfill with compact fill and top with 6" of topsoil. Slope grade away from church a minimum of 5% to 10'-0" from church. At 10'-0", transition into existing grade. Church is to determine finish plantings.

GENERAL NOTES

1. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS & DIMENSIONS AND REPORT DISCREPANCIES TO ARCHITECT.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE DURING DEMOLITION AND REPAIR OF BUILDING AND SITE COMPONENTS. CONTRACTOR SHALL PROVIDE REPAIR/REPLACEMENT/RESTORATION AS DETERMINED BY ARCHITECT/OWNER.
3. CONTRACTOR SHALL VERIFY DESIGNATED ROUTES, METHODS, AND SCHEDULES FOR DELIVERY, STORAGE, AND REMOVAL OF CONSTRUCTION MATERIALS AND DEBRIS WITH OWNER.

MATERIAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS: SEE GENERAL NOTES

DIVISION 2 - SITE WORK:

- BACKFILL & FILL WITH SATISFACTORY SOILS: ASTM D 2487 SOIL CLASSIFICATION GROUP GW, GP, GM, SW, SP, AND SM OR A COMBINATION OF THESE GROUP SYMBOLS; FREE OF ROCK OR GRAVEL LARGER THAN 3 INCHES IN ANY DIMENSION; DEBRIS, WASTE FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER.

DIVISION 3 - CONCRETE:

- CAST-IN-PLACE. SUBMIT DESIGN MIX FOR REVIEW IF USED.

DIVISION 4 - MASONRY:

- BRICK OR CONCRETE MASONRY UNITS TO INFILL MASONRY PENETRATIONS AT CHURCH. SELECTION TO BE REVIEWED WITH ARCHITECT.

- CLEAN, REPAIR, PATCH EXISTING CHURCH WALL EXTERIOR MASONRY AS REQUIRED. CLEANING PROCEDURES & PRODUCT MATERIALS TO BE REVIEWED WITH ARCHITECT.

DIVISION 5 - METALS: NOT USED

DIVISION 6 - WOOD AND PLASTICS: NOT USED

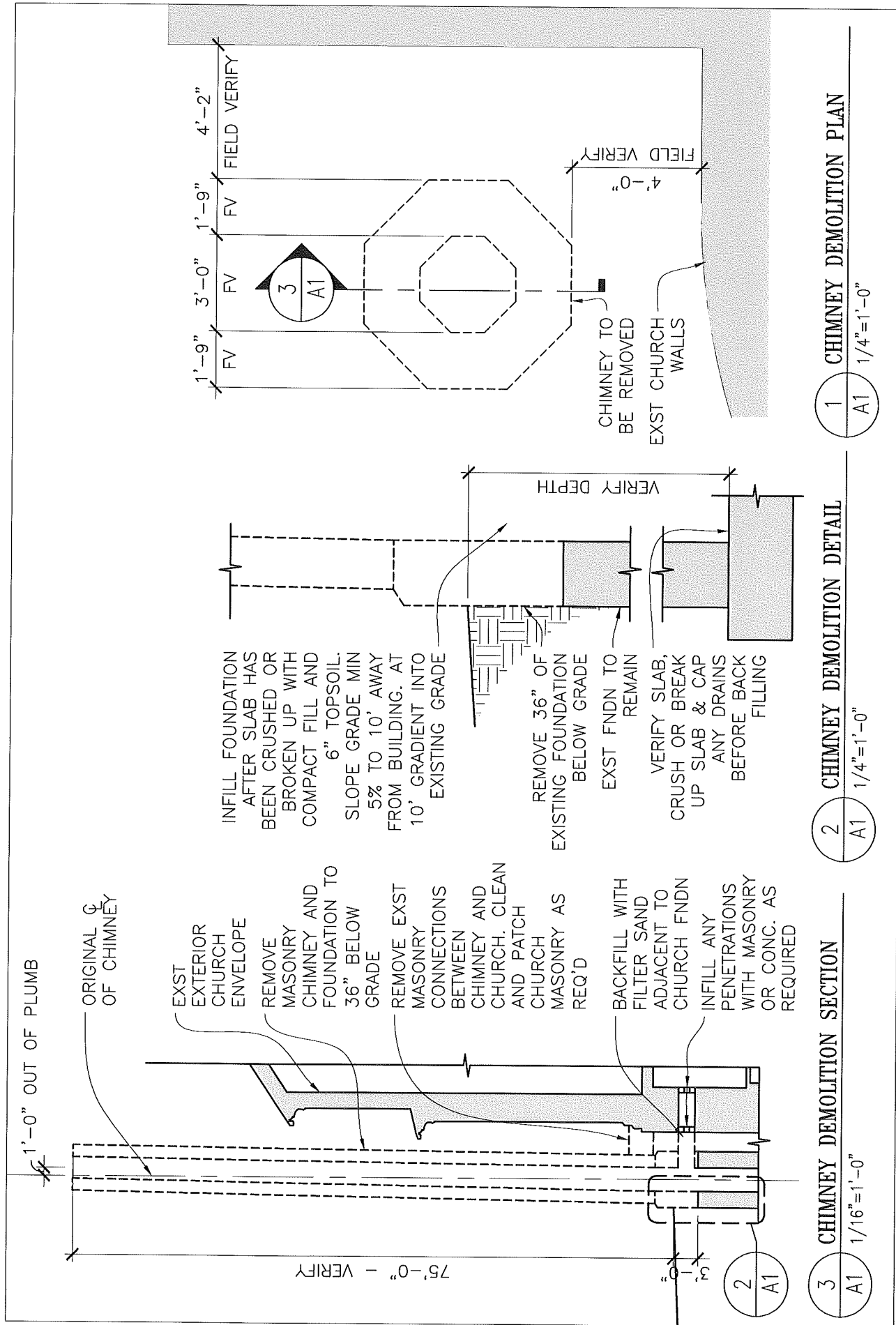
DIVISION 7 - THERMAL AND MOISTURE PROTECTION: NOT USED

DIVISION 8 - DOORS AND WINDOWS: NOT USED

DIVISION 9 - FINISHES: PAINTING

DIVISIONS 10-16: NOT USED

T1



miller dunwiddie
ARCHITECTURE


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Minneapolis MN 55401 -1657**

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Journal of Management Inquiry 22(1) 3-17
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DOI: 10.1177/1056492613505267
<http://jmi.sagepub.com>

PROJECT:
Church of the
Assumption
Chimney
Demolition
St. Paul, Minnesota

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

	Signature
Melissa M. Ekman, AIA, NCARB	
Name	
February, 15, 2013	47993
Date	License #

[illegible]

COMM. NO.: ASM1202 DRAWING NUMBER:

DATE: February 15, 2013

DRAWN: MME

CHECKED: CDL

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IA



McGOUGH

Building for the Next Generation

Assumption Church

Project: Chimney Demolition
Architect: Miller Dunwiddie
Estimate: Preliminary Budget

Location: St. Paul, MN
Estimate By: JI, TN
Date: 02/20/13

Pay Item	Cost Code	Description	Quantity	Unit	Totals	
					Unit Price	Amount
		Construction				
		Temporary Conditions	1	lot	0.00	0
		Barricades and signage			4,699.75	4,700
		Roof and window protection			0.00	0
		Chimney Demolition Complete			0.00	0
		Demo and remove 75' chimney to grade	75	ft	300.40	22,530
		Scaffolding and trash chute	1	Lot	31,995.09	31,995
		Disposal	1	Lot	3,860.31	3,860
		Site restoration	1	Allow	2,000.00	2,000
					0.00	0
		General Conditions	1	lot	0.00	0
					2,603.41	2,603
					0.00	0
		Subtotal Construction Costs	1	GSF	\$67,688.65	\$67,689
		Miscellaneous Costs				
		Building Permit	2.0000%		67,688.65	1,354
		General Liability Insurance	0.9500%		0.00	0
					69,042.42	656
		Subtotal Construction & Misc. Costs	1	GSF	\$69,698.32	\$69,698
		Fees & Contingency				
		Design Contingency	0.00%		\$0.00	\$0
		Construction Contingency	5.00%		\$3,484.92	\$3,485
		CM/GC Fee	5.00%		\$3,659.16	\$3,659
		Total Construction Costs	1	GSF	\$76,842.40	\$76,842

Clarifications:

Existing chimney foundation to remain

Mechanical and Electrical disconnections or modifications are not included



McGOUGH

Building for the Next Generation

Assumption Church

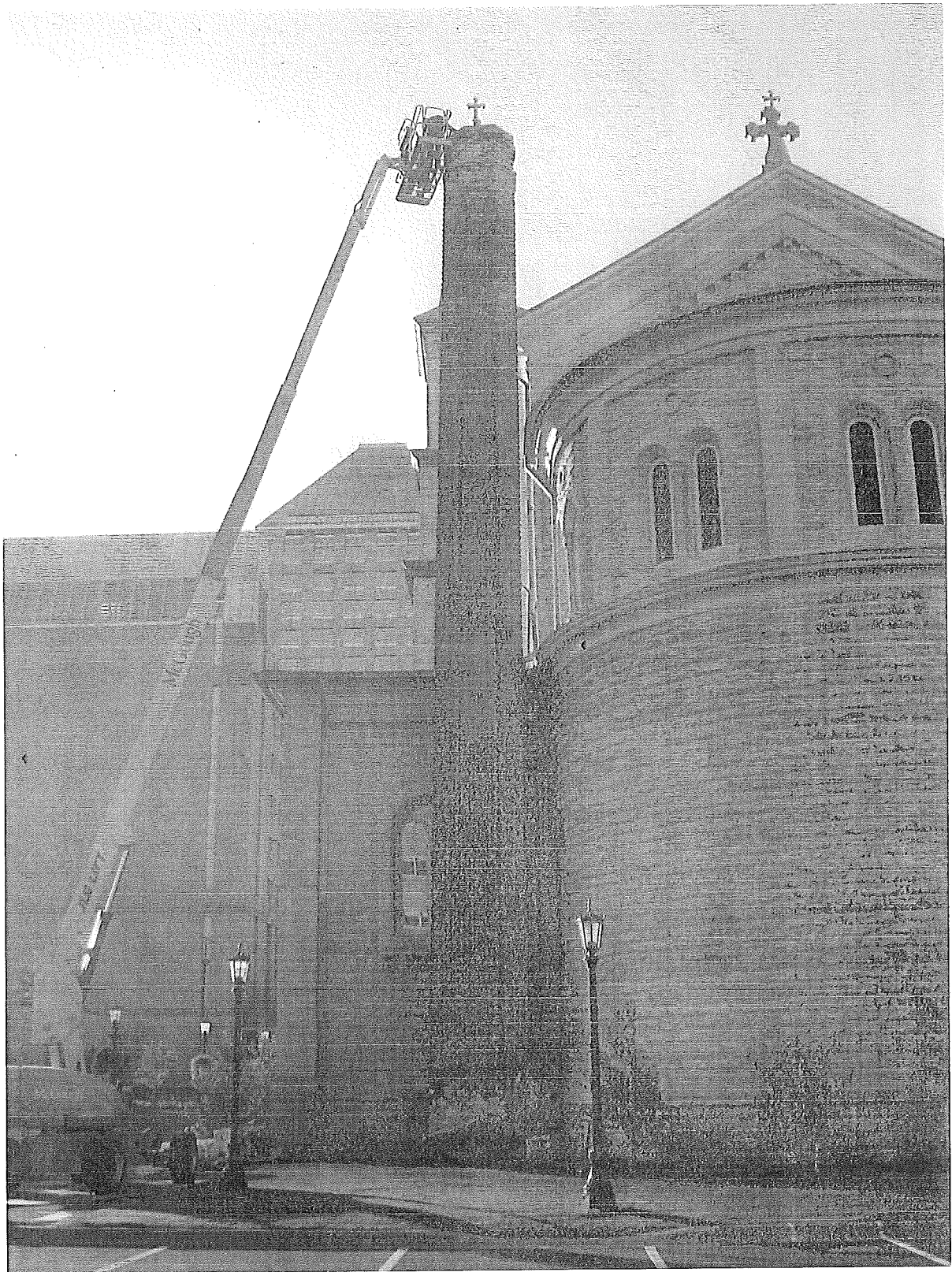
Project: Chimney Repairs
Architect: Miller Dunwiddie
Estimate: Preliminary Budget

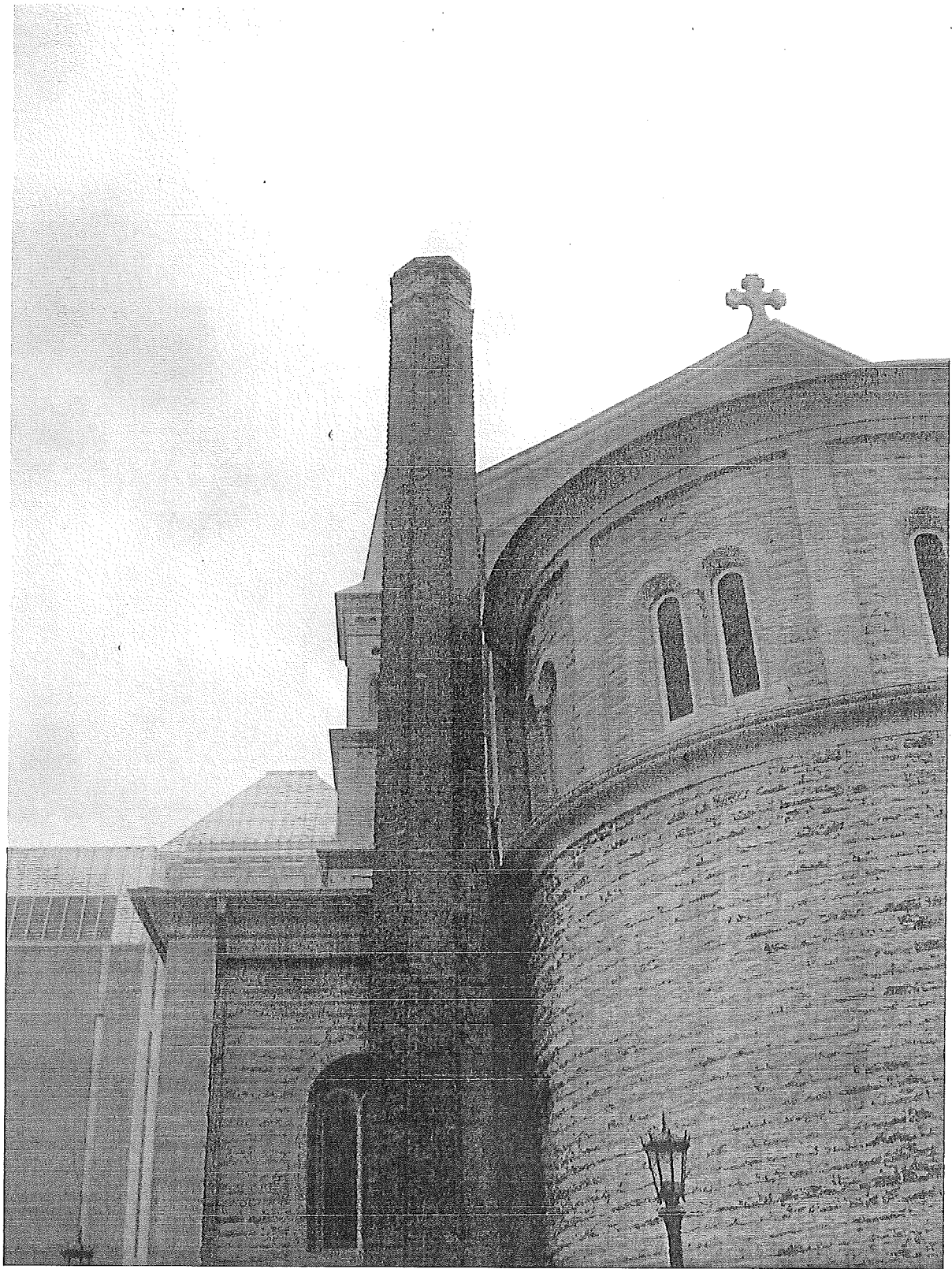
Location: St. Paul, MN
Estimate By: JI, TN
Date: 02/20/13

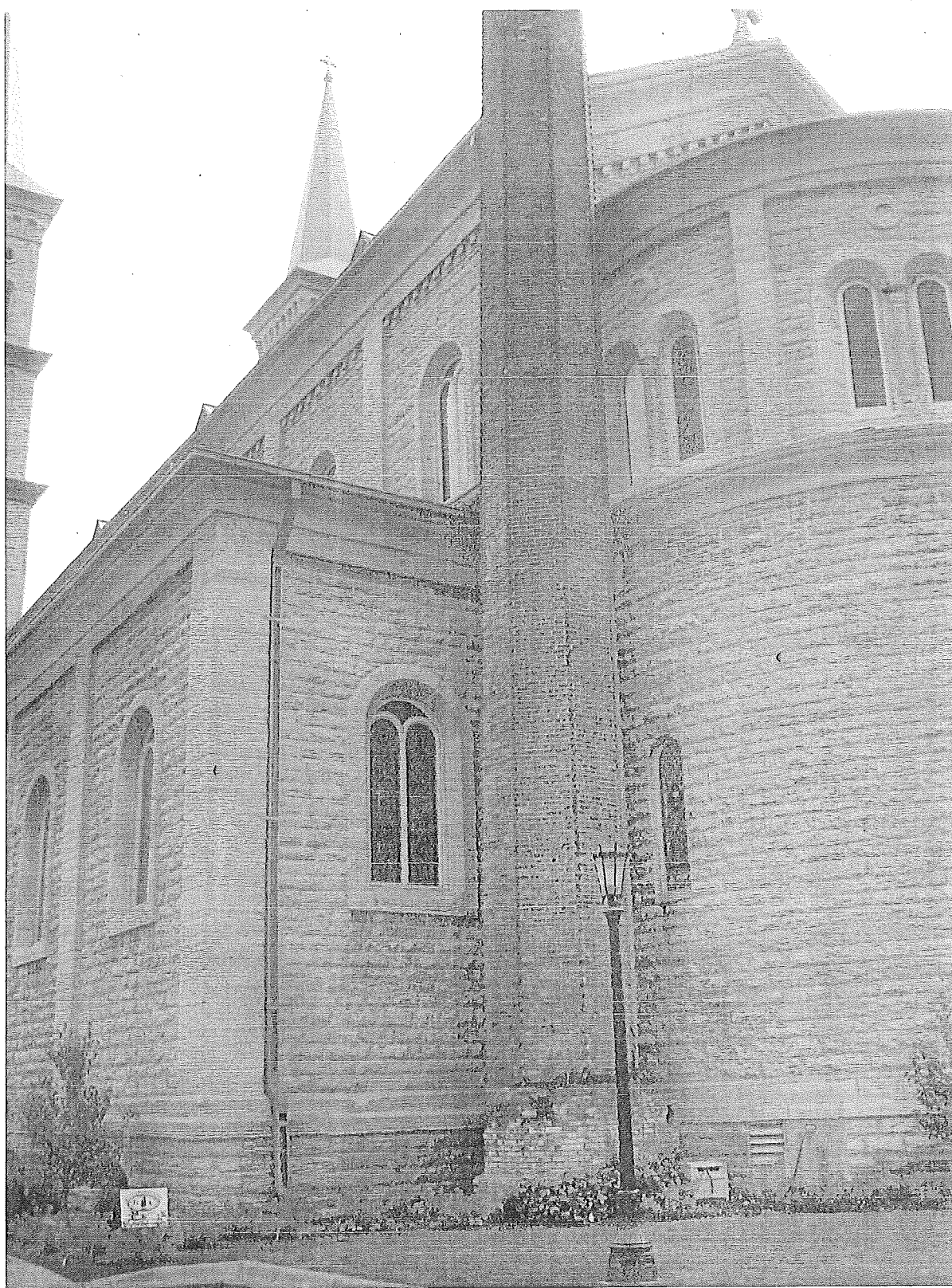
Pay Item	Cost Code	Description	Quantity	Unit	Totals	
					Unit Price	Amount
		Construction				
		Temporary Conditions	1	lot	0.00	0
		Barricades and signage			6,234.52	6,235
		Roof and window protection			0.00	0
		Partial - Chimney Demolition and Rebuild			0.00	0
		Demo and remove 15' chimney of Chimney	15	ft	434.29	6,514
		Salvage face brick for reinstallation	2,450	ea	2.45	5,998
		Relay brick chimney 15'	9,720	ea	4.09	39,790
		Acid wash rebuilt chimney	360	sf	4.98	1,793
		Restoration wash	1,920	sf	3.04	5,837
		Scaffolding and trash chute	1	Lot	26,264.63	26,265
		Material hoisting	1	Lot	3,750.00	3,750
		Disposal	1	Lot	1,000.35	1,000
		Site restoration	1	Allow	2,200.00	2,200
		Chimney Bracing			0.00	0
		Steel support braces and thru bolt anchoring	2	ea	10,500.11	21,000
		Interior building finishes - Access and restoration for anchoring	1	allow	15,000.00	15,000
					0.00	0
					0.00	0
		General Conditions	1	lot	0.00	0
					8,122.90	8,123
					0.00	0
		Subtotal Construction Costs	1	GSF	\$143,504.61	\$143,505
		Miscellaneous Costs				
		Building Permit	2.0000%		143,504.61	2,870
		General Liability Insurance	0.9500%		0.00	0
					146,374.70	1,391
		Subtotal Construction & Misc. Costs	1	GSF	\$147,765.26	\$147,765
		Fees & Contingency				
		Design Contingency	20.00%		\$29,553.05	\$29,553
		Construction Contingency	15.00%		\$26,597.75	\$26,598
		CM/GC Fee	5.00%		\$10,195.80	\$10,196
		Total Construction Costs	1	GSF	\$214,111.86	\$214,112

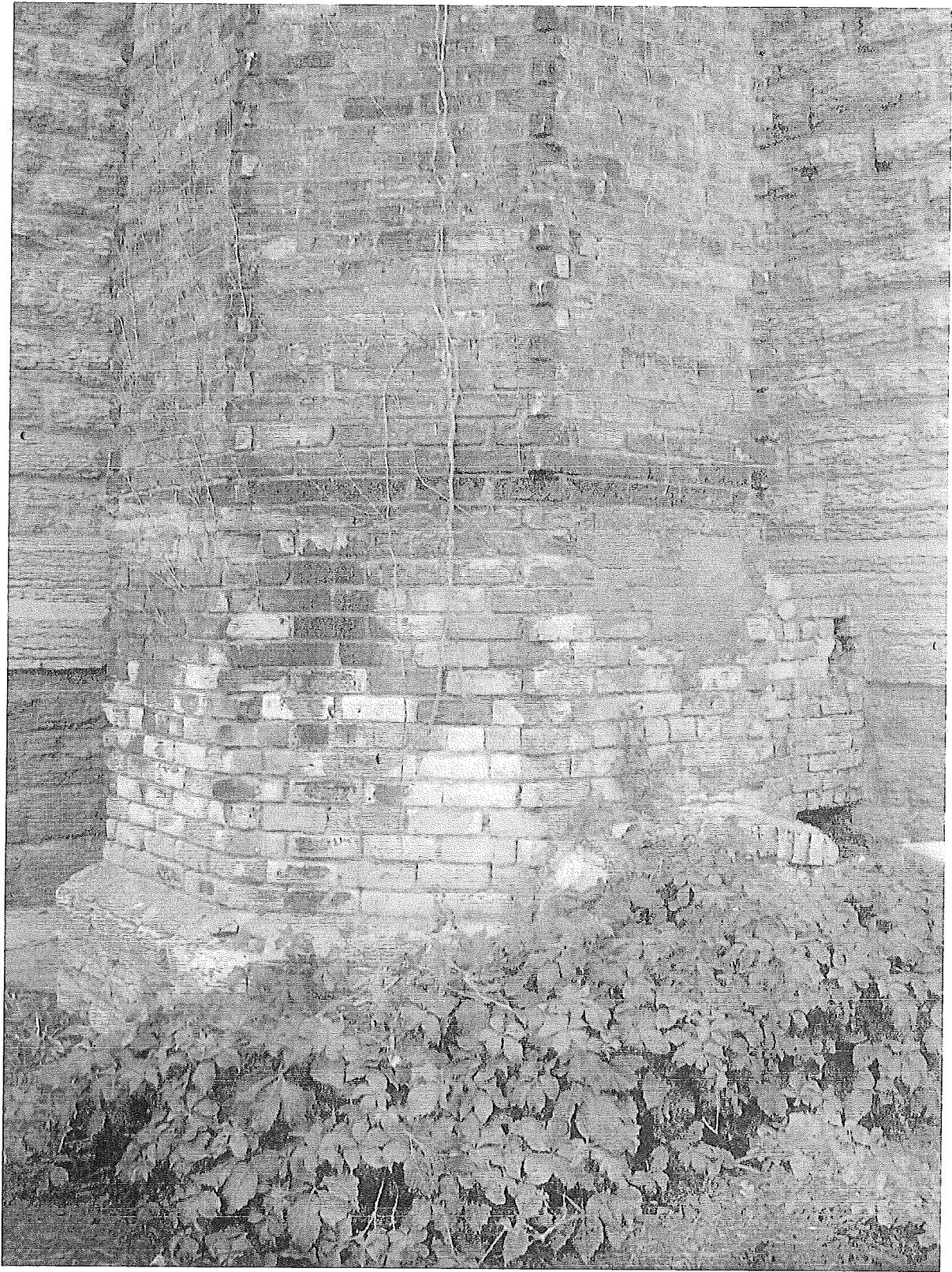
Clarifications:

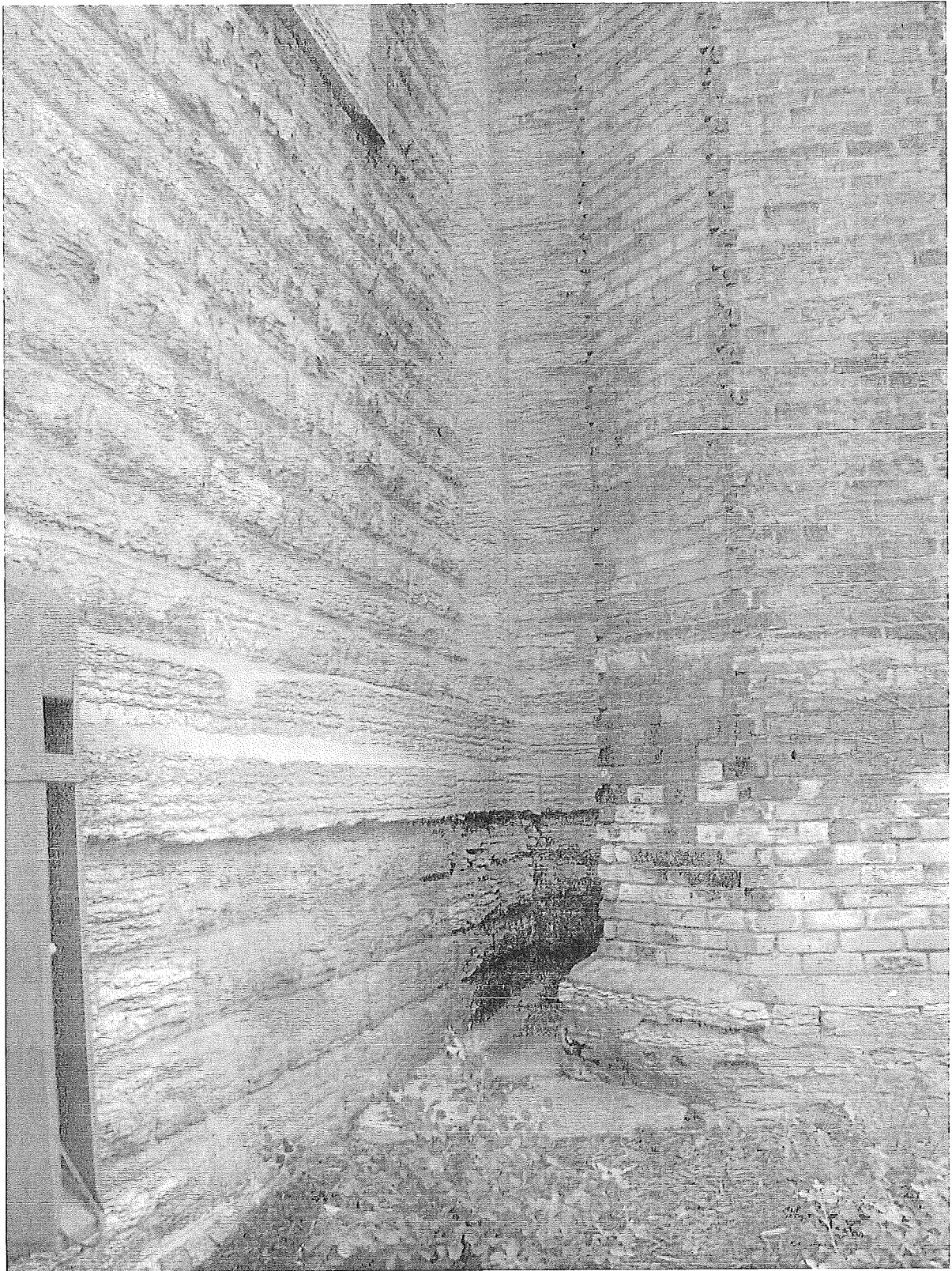
Assumes the reuse of roughly 50% of the existing brick for the build back

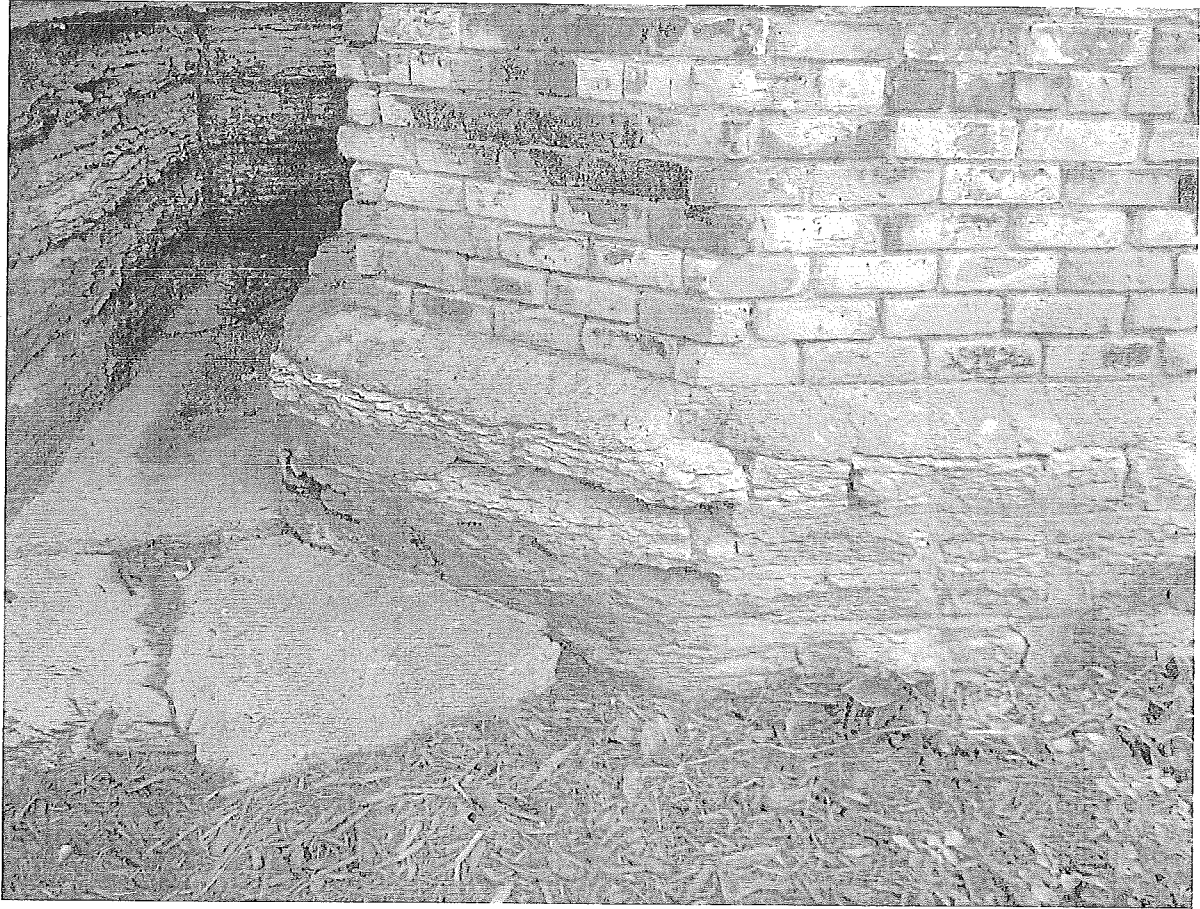




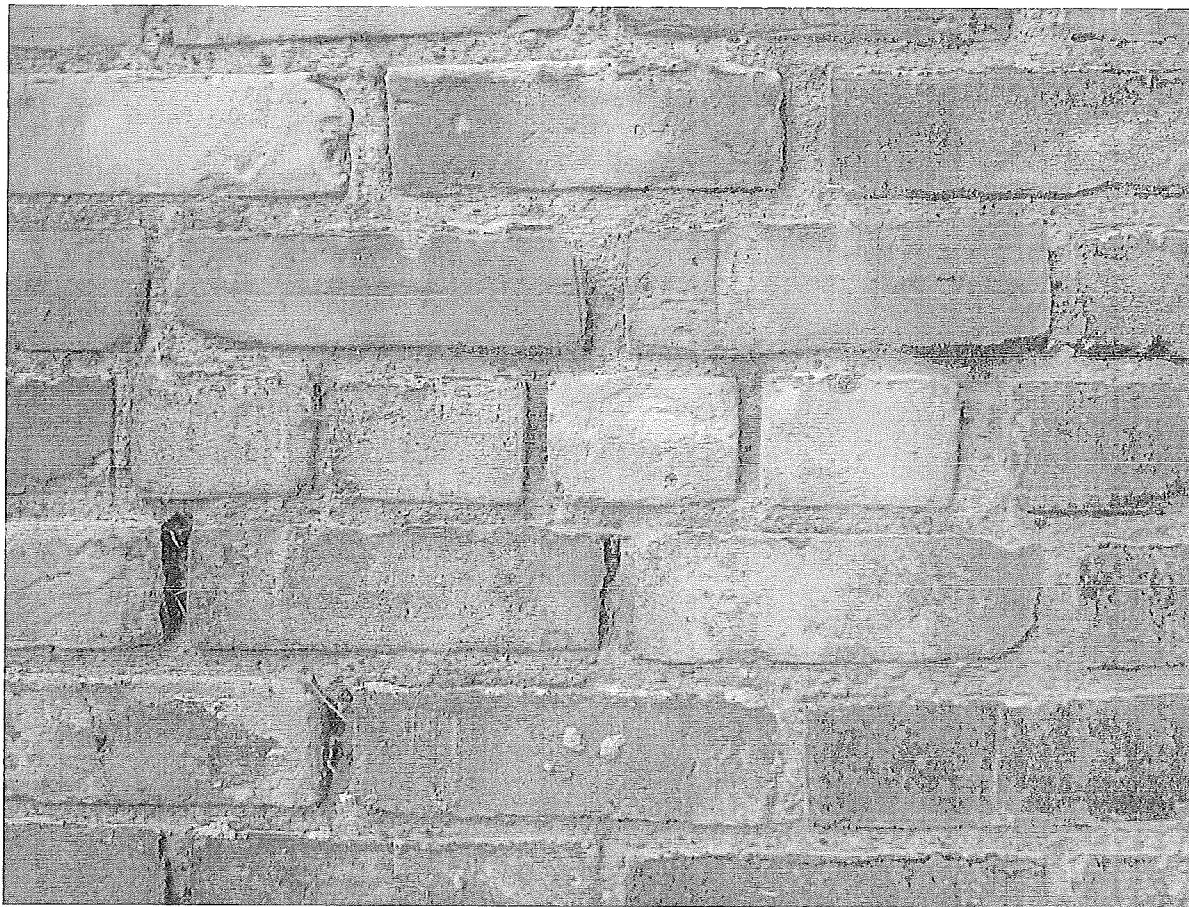


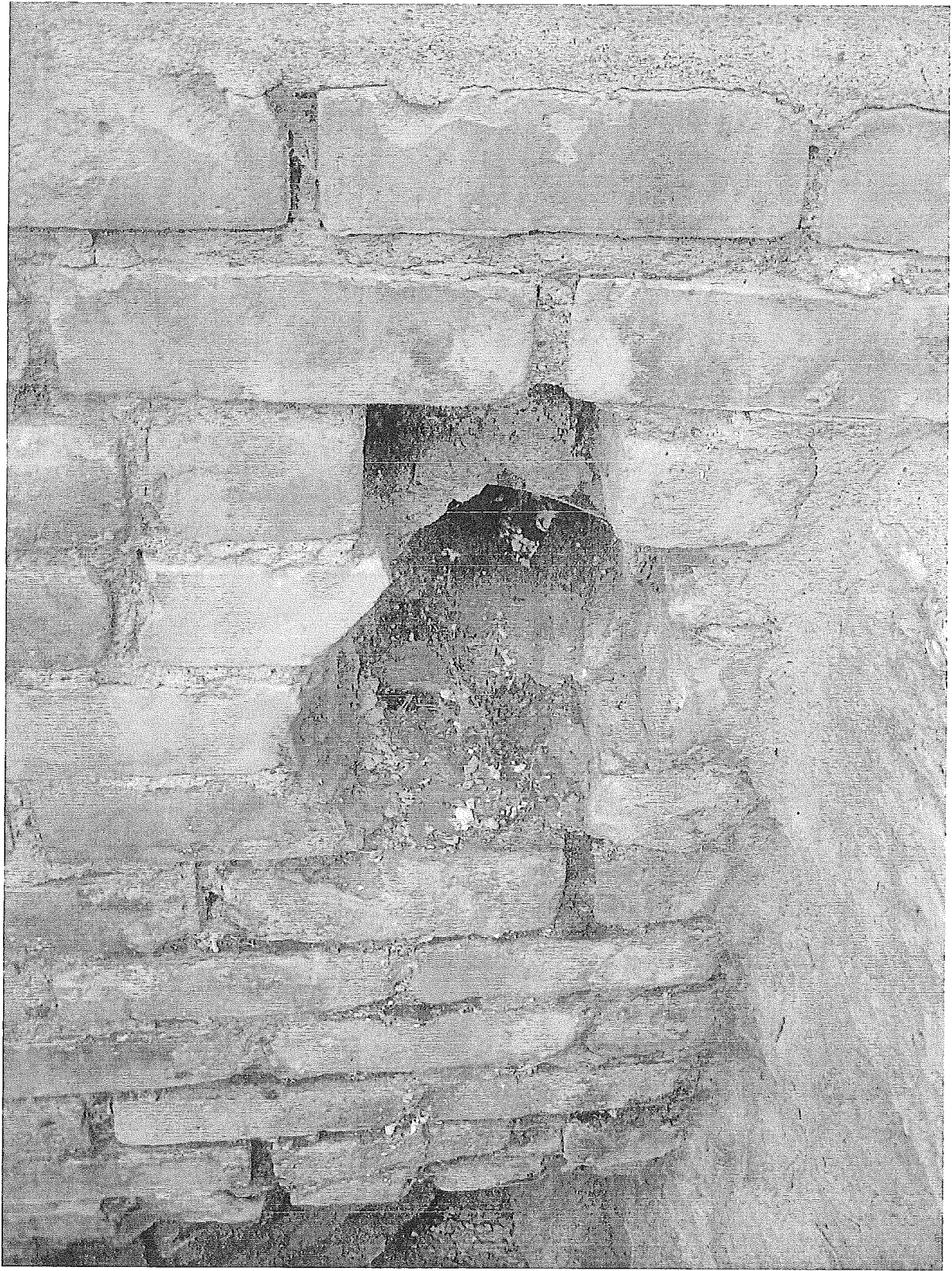


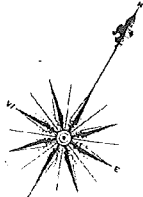












7

EXCHANGE ST. W.

GERMAN ASSUMPTION SCHOOL

GERMAN ASSUMPTION SCHOOL (2nd Bldg.)

GERMAN ASSUMPTION CHURCH

EXCHANGE ST. N.

W. 8TH

FRANKLIN ST. N.

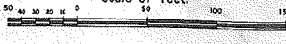
W. 9TH

6

ST. PETER

W. 7TH

Scale of Feet.



3